

Abstract

A method for fabricating a semiconductor structure includes providing a semiconductor substrate, providing a plurality of trenches in the semiconductor substrate using a first hard mask, and causing the hard mask to recede by a predetermined distance with respect to the trench wall at the top side of the semiconductor substrate for forming a first hard mask that has been caused to recede. An isolation trench structure is provided in the semiconductor substrate using a second hard mask, the isolation trench structure subdividing the first first hard mask that has been caused to recede along rows into strip sections and the strip sections of adjacent rows being arranged offset with respect to one another. The receding process results in a reduction of an overlap region between two strip sections of adjacent rows in comparison with an overlap region which would be present without the receding process. The second hard mask is removed and the isolation trench structure is filled and planarized with a filling material using the first hard mask subdivided into the strip sections.

List of reference symbols

G1-G8	Trench capacitors
AA1-7	Active regions
STI	Shallow trench isolation
r1, r2	Rows
s1, s2, s3	Columns
10	Si semiconductor substrate
20	Polysilicon filling
OS	Top side
G11, G12, G21	Trench
UC	Undercut region
V	Connecting line
Δ	Receding distance
50, 50'	Silicon nitride hard mask
HM	Hard mask made of silicon oxide
ST	Isolation trench structure
50 ₁ ', 50 ₂ ', 50 ₃ '	Strip sections
FI	Insulating filling material made of silicon oxide
KB	Overlap region
KB'	Reduced overlap region